NRC/NEI Management Meeting on
Steam Generator Issues - November 28, 2001

List of attendees:

Name	Organization	Tel. No.
Maitri Banerjee	NRC/NRR/DLPM	301-415-2277
Edmund Sullivan	NRC/NRR/DE	301-415-2796
Louise Lund	NRC/NRR/DE	301-415-3248
Brian Sheron	NRC/NRR/ADPT	301-415-1274
James F. Mallay	Framatome-ANP	434-832-2981
Alex Marion	NEI	(202)739-8080
Jim Riley	NEI	202-739-8137
Mike Tuckman	Duke	704-382-2200
Jack Strosnider	NRC/NRR/DE	301-415-3298
Bill Bateman	"	(301)415-2795
April Smith	"	(301)415-1356
Emmett Murphy	"	301 415 2710
Steve Long	"	301-415-1077
Lane Hay	SERCH Bechtel	301 228 6312
Ken Karwoski	NRC/NRR/DE	301-415-2752
Cheryl Kilaen	NRC/NRR/DE	301-415-2751
Herm Lagally	Westinghouse	724 722-5082
Bob Keating	Westinghouse	724-722-5086
Bob Tjader	NRC/NRR/RTSB	301-415-1187
Mohamad Behravesh	EPRI	(650) 855-2388
Mati Merilo	EPRI	650-855-2104
Gary Henry	EPRI	704-547-6132

NRC/NEI Management Meeting on
Steam Generator Issues - November 28, 2001

List of attendees:

Name	Organization	Tel. No.
Robert Cullen	Entergy	914-272-3522
DAVID STEININGER	EPRI	650-855-2019
Helen Cothron	TVA	423-751-7658
BOB EXNER	PG&E	805 545 4302
MICHAEL SHORT	So. Calif. Edison	949-368-6244
RICK MULLINS	SOUTHERN Co.	205.992.5502
VAUGHN WAGONER	CP&L	919-546-7959
NOEL DUDLEY	ACRS	301-415-6888
Jim Meister	Exelon	630/657-3800

NRC/NEI Management Meeting
November 28, 2001

- Objective of meeting
- Activities on GLCP since last mgmt meeting
- Issues that need to be resolved
- Proposed resolution of remaining issues
- Proposed schedule to complete GLCP
- Generic actions in response to TMI severed tube
- Future actions and meetings

Attachment 2

Objective of Meeting

- Discuss and reach agreement on remaining actions and schedule for final NEI 97-06 Generic License Change Package (GLCP)
- Discuss generic actions in response to TMI - 1 severed tube

Activities on GLCP since last Management Meeting

- Last SMM was held on Feb 16, 2001
- Discussed SGAP, SG DPO, review of GLCP, and SG operablility issue
- Process for completing review of GLCP and proposed schedule
- NEI discussed activities undertaken by industry since IP2 tube failure

Activities on GLCP since last Management Meeting (Cont'd)

- Spring 2001 - resolved operability issue
- Staff identified concerns with the industry guidelines – Aug 2, 2001 letter
- Industry proposed new inspection intervals – Aug 29, 2001 meeting
- Staff comments – Sept 28, 2001
- Industry proposal on regulatory controls – Nov 2, 2001

Issues to be Resolved

- Acceptable inspection interval criteria
- Regulatory controls on inspection intervals

Proposed Resolution

- Staff concludes Admin TS controls on inspection intervals needed
- Admin TS to require staff approval of maximum inspection intervals or alternate methodology
- Resolution of guideline issues, implement performance based approach in longer term

Proposed schedule to complete GLCP

- Staff proposing January 31, 2002 as target date for submitting necessary changes to GLCP
- Allow issuance of draft safety evaluation for public comment by April 2002 and RIS/SE on GLCP by mid-2002

Steam Generator Program

Senior Management Meeting
November 28, 2001

NEI

Presentation Outline

- Meeting Objective
- Open Issues
- Proposed Resolutions
- Proposed Schedule
- Implications of TMI Severed Tube
- Future Actions

NEI

Meeting Objective

- Communicate industry and NRC positions on current SG issues
- Review current status
- Determine direction of future actions
- Conceptualize schedules

NEI

Open Issues

- SG Action Plan technical issues include:
  - Assessment of degradation mechanisms – E&R IRG
  - NDE data quality – SG Exam G/L rev 6
  - NDE qualification – SG Exam G/L rev 6
  - NDE data analysis – SG Exam G/L rev 6
  - Pressure testing – In Situ Test Ad Hoc
  - Operational assessment – IA Ad Hoc
  - Tech Specs - GLCP
  - NEI 97-06 initiative - GLCP

NEI

Open Issues

- SG Action Plan technical issues
  - Industry responses provided to NRC last summer
  - NRC commented on most of the responses
  - Resolution dependent on Ad Hoc committee work, receiving remaining comments, and disposition of the inspection interval issue

NEI

Open Issues

- SG inspection intervals
  - Technical issue – NRC believes longer inspection intervals increases uncertainty of degradation predictions and risk
    - Industry working on revision 6 of the SG Exam G/L
      - December meeting to resolve big picture issues
      - Jan meeting to complete comment disposition
    - NRC "can work with" the prescriptive based inspection interval requirements in rev 6
    - NRC forwarded comments on the prescriptive inspection interval requirements
      - Industry will provide written response to NRC comments
    - Rev 6 publication in the first half of 2002

NEI

Open Issues

- SG inspection intervals
  - Regulatory control issue – NRC wants to control the maximum length of SG inspection intervals:
    - NRC proposes a admin TS to control changes to inspection intervals and SG Program limitations on maximum length. Allows generic approval of methodologies and maximum inspection intervals
    - Industry proposed a commitment to a maximum inspection interval and NRC notification if a plant intends to exceed the maximum length
    - NRC letter of November 26 rejected industry proposal – a direct and enforceable requirement is required

NEI

Proposed Resolution

- Industry can accept the concept of an admin TS controlling changes in inspection intervals with interval lengths defined outside of TS,
- But only if the technical issues surrounding extended intervals are resolved first

NEI

Proposed Resolution

- Admin TS governing approval of changes to inspection intervals similar to that proposed by NRC except that generic approval of methodologies to determine inspection intervals is allowed
- License amendment cover letter commits to maximum inspection interval
- Changes to maximum intervals and methodologies for determining intervals require NRC approval

NEI

Proposed Schedule

- Disposition industry and NRC comments on rev 6 – early 2002
- Reach agreement on extended inspection intervals – by mid 2002
- Submit final GLCP reflecting inspection intervals – mid 2002
- Issue SG Exam G/L rev 6 – mid 2002
- Approve GLCP – late 2002
- GLCP amendment requests – 2003
- GLCP implementation – 2003

NEI

TMI Results

- Tubes Deplugged & Evaluated
  - S/G A: 647 H/L plugs removed
  - S/G B: 223 H/L plugs removed
- Dewatering Results
  - 263 contained water in tube
  - No tubes with original I-690 plugs contained water or any evidence of swelling
- Inspection Results
  - 29 tubes have swelling present
    - West Alloy 600 re-rolled plugs top and bottom
    - I-600 re-rolled or replaced with B&W Alloy 690 rolled plugs on top and B&W ribbed plugs bottom
  - 2 tubes were severed (1 at UTS, 1 at 15th TSP)
  - Wear on 4 tubes from UTS severed tube (B66-130 neighbors only)

NEI

TMI Results

- Root Cause for B66-130
  - I-600 Plug In-leakage
    - Trapped water by replacing with I-690 plug
    - Tube swelling
    - Restrained lateral motion
    - Decreased system damping
  - FIV
    - High cross flows in top span
    - Tube restrained at 15th TSP
    - Reduced margin to instability
    - Fatigue Failure

NEI

ONS-3 Process

- Criteria for De-plugging Tubes:
  - I-600 plugs installed in H/L and/or C/L
  - I-690 plugs that replaced original I-600 plugs in H/L
- Inspection Process
  - Tube dewatered, amount measured
  - EC profilometry used to determine tube swelling
  - MRPC used for defect characterization

NEI

ONS-3 Results

- De-plugged & Evaluated for TMI Issues
  - S/G A: 55 H/L plugs removed (4 for plug indications)
  - S/G B: 53 H/L plugs removed
- Dewatering Results
  - 22 Tubes contained water
  - 6 Tubes > 70% water level
- Inspection Results
  - No tubes have any swelling present
  - No tubes were severed
  - No wear on any adjacent inservice tubes

NEI

Initial BWOG Assessment

- Water in-leakage must be present over extended period to allow sufficient water column to buildup and produce swelling
- Tube swelling a necessary precursor to damage from FIV resulting in severed tube
- Water level in tube effected by:
  - Plug Type
  - Installation Process
  - Replacement plugs trapping contained water

NEI

BWOG Plug Type Assessment

- Tubes most susceptible to swelling contain plug types:
  - Re-rolled West I-600 type plugs in upper and lower tube sheet originally used prior to 1990 (TMI only)
  - I-600 plugs in UTS replaced with I-690 and with leak tight plugs (like B&W ribbed plugs) in LTS
- Based on history and TMI inspections there is no evidence that I-690 plugs originally installed are subject to significant water in-leakage.

NEI

Non B&W SG Assessment

- Time is available to study the issue:
  - Response to NRC Bulletin 88-02 on rapidly propagating fatigue cracks in U-bends
  - Operating experience shows that among the plug diode effects observed, only axial failures occurred
  - Unplugged hundreds of tubes – no known severed tubes
  - Thousands of locked / dented tubes with no fatigue failure

NEI

BWOG Actions

- Review Plug Installation Process for:
  - Correlation to tubes containing water
  - ONS-3 vs TMI inspection finding differences
  - Critical parameters during initial plug installation that could affect susceptibility
- Evaluate FIV susceptibility by tube location
- Identify population of high risk plugged tubes at B&W plants
- Establish generic recommendations

NEI

Industry Activities

- BWOG:
  - B&W OG meeting week of 12/3
    - Develop actions and schedule for completion
- Industry:
  - SGMP TAG Meeting week of 12/10
    - Develop actions and schedule for completion
- Meet with NRC after actions defined

NEI

Near Term Actions

- Industry meet with staff on TMI tube sever issue in late January
  - Present planned actions and schedule for completion

NEI